REMARKS

Reconsideration of this application is respectfully requested in view of the foregoing amendment and the following remarks.

Claims 1-11 were pending in this application. In this Amendment, Applicant has canceled claim 1 as directed to a non-elected invention. Applicant has also amended claim 2 into independent form and has added new claims 12-20, which Applicants believe are properly aligned with the elected invention. Accordingly, claims 2-20 will be pending upon entry of this Amendment.

In the Office Action mailed June 11, 2008, the Examiner rejected claims 2-7 and 10 under 35 U.S.C. § 102(b) as being anticipated by EP 0930641 A2 to Kiguchi et al. ("Kiguchi"). Under 35 U.S.C. § 103(a), the Examiner rejected claims 8, 9, and 11 as being unpatentable over Kiguchi in view of U.S. Patent No. 6,655,791 to Crockett et al. ("Crockett"). To the extent that those rejections might still be applied to the claims currently pending, Applicants respectfully traverse the rejections. The following remarks are organized under subheadings corresponding to the rejections and new claims.

35 U.S.C. § 102(b): Claims 2-7 and 10

Applicant respectfully disagrees with the Examiner's position that claim 2 is unpatentable over Kiguchi for the following reasons.

According to the Examiner, Kiguchi teaches an apparatus that includes, among other things, "a tubular dispensing means in the form of an ink-jet print head equipped with a nozzle plate having a plurality of tubular nozzles (col. 7, lines 42-53)." Applicants respectfully note, however, that the Examiner's quotation is not a literal citation of column 7, lines 42-53 of

Kiguchi – nor is it a correct summary of that passage. The pertinent portion of that passage reads as follows:

> The ink-jet print head 2 in Fig. 18 is obtained by fitting into a casing 25 a nozzle plate 21 equipped with nozzles 211, and a pressure chamber substrate 22 equipped with a diaphragm 23. The pressure chamber substrate 22 may, for example, be formed by silicon etching and provided with cavities (pressure chambers) 221, side walls 222, a reservoir 223, and the like.

At column 8, lines 3-6, Kiguchi goes on to explain that "[t]he nozzles 211 in the nozzle plate 21 are formed such that their positions correspond to the cavities 221 when the plate is placed on the top of the pressure chamber substrate 22." Figure 18 shows pressure chambers 221, each pressure chamber 221 being provided with only one nozzle 211. From column 8, lines 14-24, it is to be understood that the volume of each cavity 221 can be changed independently from the other cavities 221, resulting in an injection of ink through only one nozzle 211, well selected, and independently from the other nozzles 211.

Thus, even if one would consider each of these pressure chambers 221 as a tubular dispensing means, the ink-jet print head 2 as a whole can only be considered as a manifold of parallel tubular dispensing means, each of which contains *only one nozzle*. In contrast, the present invention as recited in claim 2 comprises not just one outlet opening, but multiple openings in a dispensing means, support for which can be found in the present specification at, for example, page 4, lines 21-22. Moreover, nowhere does Kiguchi teach that the manifold of parallel tubular dispensing means is disposed horizontally, as recited in claim 2. Kiguchi therefore does not teach or suggest a tubular dispensing means disposed horizontally and provided with lateral outlet openings, as recited in claim 2.

Applicants therefore respectfully submit that amended claim 2 is patentable over Kiguchi. In addition, Applicants respectfully submit that dependent claims 3-11 are also patentable due at least to their dependence on an allowable base claim and for the additional features recited therein.

35 U.S.C. § 103(a): Claims 8, 9, and 11

Initially, Applicants confirm that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made.

Regarding the § 103 rejection, by citing both Kiguchi and Crockett in the Office Action, it is implicitly suggested that these prior art references pertain to art analogous to the present invention. It should be noted, however, that both Kiguchi and Crockett relate to ink-jet printing techniques, in which very small droplets of ink are ejected upon a substrate, in order to obtain a pattern with relatively high resolution.

In contrast, the present invention relates to an apparatus for applying in reproducible manner a second layer that is homogenous onto a first layer of a nanocrystalline material, *e.g.*, for a layer of a sufficient width for a photovoltaic element, which layer can be applied in a short period of time. Such an apparatus is to be used for the manufacture of photovoltaic elements on industrial scale. (*See, e.g.*, page 1, line 24 to page 2, line 6 of the present specification.) Applicants therefore respectfully submit that both Kiguchi and Crockett are non-analogous art to which one skilled in the art would not look in solving the photovoltaic element manufacturing problems of the present invention, and respectfully requests withdrawal of the § 103 rejections on that basis alone.

Even assuming that Kiguchi and Crockett are analogous art (which Applicants believe they are not), Applicants respectfully disagree with the Examiner in his opinion that claims 8, 9, and 11 are unpatentable over Kiguchi in view of Crockett, for the following reasons.

The Examiner correctly notes that Kiguchi fails to teach a tubular dispensing means being connected at a second outer end to a second liquid supply line, as recited in claim 8. For that feature, the Examiner relied on the printhead arrangement of Crockett and stated that one would have been motivated to modify Kiguchi with Crockett because it would increase industrial applicability not only by improving quality but also by reducing manufacturing cost. (Office Action at page 5, lines 11-13.) Applicants respectfully submit, however, that Kiguchi teaches away from such a modification by disclosing *specially treated* inks that are ejected onto a substrate. (*See, e.g.*, ¶ [0010].) The inks are treated in advance of, during, and after ejection, therefore rendering any recirculation inapplicable. In addition, there is no hint of the present invention's object of enabling one to apply a relatively wide layer (of the second material), as described in the present specification at, for example, page 3, line 27-28. Therefore, Applicants respectfully submit that the subject matter of claim 8 is patentable over Kiguchi and Crockett.

Claim 9 is also patentable over Kiguchi because of the recited location of the lateral outlet openings. Kiguchi teaches lateral openings 211 in the bottom side of the dispensing means 2. (*See, e.g.*, Figure 20.) These opening 211, however, are directed toward the substrate 1 upon which the droplets 11of ink are to be ejected. (Figure 1.) This implies that it is impossible for Kiguchi to direct the lateral openings in the top side of the dispensing means 2, remote from the substrate 11, because in such an arrangement the droplets of ink 11 could not be ejected upon the substrate 1. In contrast, claim 9 recites lateral outlet openings provided in the top side of a

horizontally disposed tubular dispensing means 2. That feature of claim 9 is therefore neither disclosed nor suggested by Kiguchi or by ordinary skill, and therefore is not obvious in view of Kiguchi. Indeed, it has been found that an exceptionally homogeneous layer is applied with an apparatus according to the present invention (*see, e.g.*, page 3, lines 34-37 of the present specification), which consequently represents a non-obvious feature distinguishable over the prior art of record.

Thus, Applicants respectfully submit that claims 8 and 9 are patentable over the prior art based on the above additional features, in addition to their dependence on an allowable base claim. Claim 11 is patentable due at least to its dependence on an allowable base claim.

New Claims

To further recite the present invention's distinctions over the applied prior art, Applicants have added new claims 12-17, corresponding generally to the subject matter recited in original claims 2 and 8-11. New independent claim 12 recites a number of lateral outlet openings, which distinguishes over Kiguchi's teachings of only one nozzle present in each pressure chamber of the ink-jet printing head. New claims 13 and 14 correspond generally to the subject matter recited in original claim 8, with the alternative embodiments of "a liquid circulation line" or "a second liquid supply line" recited separately in claims 13 and 14. New claims 15-17 correspond generally to the subject matter recited in original claims 9-11. Support for new claims 12-17 can be found generally throughout the present specification, and especially at, for example, page 4, lines 21-22.

Applicant has also added new claims 18-20 to further recite the present invention's distinctions over Kiguchi's teachings, which are limited to only one nozzle present in each

pressure chamber of the ink-jet printing head, and which do not teach lateral outlet openings provided in the top side of the dispensing means. New claim 18 corresponds generally to the subject matter recited in original claims 2 and 9, support for which can be found throughout the present specification, especially page 4, lines 21-22. New claims 19-20 correspond generally to the subject matter recited in original claim 8, with the alternative embodiments of "a liquid circulation line" or "a second liquid supply line" recited separately in claims 19 and 20.

In view of the foregoing, all of the claims in this case are believed to be in condition for allowance. Should the Examiner have any questions or determine that any further action is desirable to place this application in even better condition for issue, the Examiner is encouraged to telephone Applicants' undersigned representative at the number listed below.

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Respectfully submitted,

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